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CURRENT SERIAL RECORDS



Dairy-Herd-Improvement Letter

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6,059 SIRES SUMMARIZED IN JANUARY 1963

In January 1963, 6,059 sires were summarized, 3,648 of which represented new sires that did not have five tested daughters in July 1962. Individual sire records were produced for 5,124 non-AI and 677 AI sires having 151,372 production tested daughters with herdmates. A total of 12,169 individual sire records were sent to the cooperating States. The performance of non-AI sires, AI sires, and the number of sires summarized is shown in Tables 1, 2, and 3, respectively.

Of the non-AI sires summarized, 46 percent maintained or increased milk yield and 48 percent maintained or increased fat yield. The corresponding values for AI sires were 48 and 57 percent, respectively. It is apparent that these sires, particularly those in AI, probably were selected more on the basis of percentage of fat or fat yield than for milk yield.

7,188,349 DHIA LACTATION RECORDS IN MASTER TAPE FILE

As of January 1963, the updated and edited master file included 7,188,349 lactation records. Of these, 5,896,904 records represent 2,484,116 cows and 300,438 sires while 1,291,445 records represent 930,207 cows which have no sire identification. The volume of the master file, by breed, is shown in Table 4.

RESEARCH NOTE

Genetic Improvement Resulting from AI

Artificial insemination (AI) has experienced dramatic growth in the U. S. since 1939. Since that time approximately 80 million cows have been bred by AI sires, the vast majority of which were dairy. In 1962 approximately 40 percent of cows of breeding age were bred by AI while the average number of cows bred per sire was 3,155. These statistics clearly emphasize the importance of AI bulls as a means of setting the pace for genetic progress. Consequently, it is important to recognize what genetic progress has been realized through AI in recent years.

The method of contemporary herdmate comparisons, as used in evaluating sires in DHIA, is not designed for and hence is not in itself effective in determining the rate of genetic progress in herds using AI. The herdmates in these comparisons often are daughters of other AI bulls. These sire evaluation procedures, and the resulting DHIA Sire Summary List, are designed to appraise individual sires so that their relative performance can be analyzed.

AI and non-AI contemporary herdmate comparisons have been used, however, by researchers in an effort to evaluate genetic progress resulting from AI. In this manner the production performance of AI and non-AI sired herdmates are compared in herds using both types of service. Two of the most recent and extensive studies (New York and Wisconsin) show genetic improvement has been realized in Holstein-Friesian DHIA herds in recent years.

In the New York study, the estimated superiority of AI progeny over non-AI herdmates was as follows:

Year	No. first-records made by AI progeny & herdmates	AI superiority	
		Milk Lbs.	Fat Lbs.
1951	2,944	262	10
1952	3,861	59	6
1953	5,608	11	3
1954	6,734	284	10
1955	6,843	331	11
1956	6,646	169	12
1957	5,057	194	8
1958	11,340	103	8
1959	8,793	357	18

These workers concluded that "the gain in genetic merit has been about one-half percent per year since 1953 until 1959, if it can be assumed that merit of non-AI progeny has remained constant."

In the Wisconsin study, where the Holstein-Friesian DHIA herds were grouped into three production levels, the estimated superiority of AI progeny over non-AI herdmates was as follows:

Level	No. available records	Yearly herd av.		AI superiority	
		Milk Lbs.	Fat Lbs.	Milk Lbs.	Fat Lbs.
Low	25,990	9,159	328	259	14
Medium	27,604	10,681	386	294	13
High	28,311	12,091	445	228	13

The AI progeny in Guernsey DHIA herds were found to be superior to their non-AI herdmates by only 22 pounds of milk and 5 pounds of fat.

All research results are not in agreement as to the rate of genetic progress resulting from AI. It is possible that regions of the country differ in this regard. However, with the exception of the two mentioned above, most of the studies have been based on small numbers of comparisons and the differences reported could be the result of random fluctuations of the data. Nationwide, it appears that real genetic improvement in production has resulted from AI in Holstein DHIA herds. The lack of rapid improvement is attributed to (1) the relatively low heritability or selectability rate (25 percent) for milk and fat yield, (2) the low degree of reliability of within herd sire proofs, (3) emphasis on traits other than production and, (4) emphasis on percentage of fat test.

ERRATUM:

March 1963 Letter. In the second paragraph on page 1, the number of dairy bulls in service in 1962 should be 2,158 and not 3,158.

Table 1--Performance of Non-AI Sires Summarized in January 1963, as measured by the Production of Progeny and their Herdmates.

Breed	Total No.	Sires				Daughters				Herdmates			
		Milk Yield		Fat Yield		Daughters with		Average Production		Milk		Test Fat	
		Maintained or increased	Decreased	Maintained or increased	Decreased	Herdmates	No.	Milk	%	Lbs.	%	Lbs.	%
Ayrshire	233	99	134	107	126	2,203	No.	9,703	4.1	398	4.1	397	
Guernsey	857	373	484	404	453	7,911		8,533	4.8	414	4.8	415	
Holstein	3,159	1,533	1,626	1,550	1,609	35,723		12,580	3.7	460	3.7	461	
Jersey	647	258	389	286	361	6,890		7,884	5.2	413	5.1	420	
Brown Swiss	170	65	105	82	88	1,641		10,626	4.1	438	4.0	440	
Milking Shorthorn	52	20	32	17	35	417		8,461	3.8	324	3.8	331	
Red Dane	2	-	2	-	2	12		10,639	3.8	402	3.7	427	
Red Poll	4	1	3	1	3	29		8,715	4.7	409	4.7	436	
Overall	5,124	2,349	2,775	2,447	2,677	54,826		11,069	4.0	441	4.0	443	

Table 2--Performance of AI Sires Summarized in January 1963, as measured by the Production of Progeny and their Herdmates.

Breed	Total No.	Sires				Daughters				Herdmates			
		Milk Yield		Fat Yield		Daughters with		Average Production		Milk		Test Fat	
		Maintained or increased	Decreased	Maintained or increased	Decreased	Herdmates	No.	Milk	%	Lbs.	%	Lbs.	%
Ayrshire	28	13	15	16	12	2,107		9,717	4.1	409	4.1	402	
Guernsey	101	40	61	53	48	4,483		8,756	4.8	423	4.7	421	
Holstein	399	230	169	239	160	83,766		12,644	3.7	467	3.7	465	
Jersey	90	18	72	36	54	3,562		8,008	5.2	416	5.0	424	
Brown Swiss	48	18	30	25	23	2,543		10,619	4.1	440	4.1	441	
Milking Shorthorn	10	7	3	7	3	79		9,321	3.8	355	3.8	339	
Red Dane	1	1	-	1	-	6		10,462	4.1	428	4.0	421	
Red Poll	-	-	-	-	-	-		-	-	-	-	-	
Overall	677	327	350	377	300	96,546		11,139	4.0	448	4.0	447	

Table 3--Number of Sire Records Summarized in January 1963, by State and Breed

State	Ayrshire	Guernsey	Holstein	Jersey	Br. Swiss	Shorthorn	Red Dane	Other	Red Poll	Total
Maine-----	18	28	118	27	9					200
New Hampshire-----	29	12	114	32	4	2				193
Vermont-----	45	28	229	80	19	2		1		404
Massachusetts-----	35	41	224	29	15	1				345
Rhode Island-----	10	4	50	3	1					68
Connecticut-----	29	63	206	24	16					338
New York-----	69	118	841	95	40	4		1		1,168
New Jersey-----	4	50	195	19	16					284
Pennsylvania-----	54	205	780	62	20	10		1		1,132
Ohio-----	13	59	252	58	28	4				414
Indiana-----	15	68	225	49	27	7				391
Illinois-----	14	54	327	43	38	10				486
Michigan-----	13	66	511	54	26	4	3			677
Wisconsin-----	13	84	558	42	47	16	1			761
Minnesota-----	26	47	312	33	33	9				460
Iowa-----	32	46	303	56	51	19				507
Missouri-----	2	22	103	34	8	6		1		176
North Dakota-----		7	58	1	13	2				81
South Dakota-----	2		51	6	4					63
Nebraska-----	1	18	115	5	16	6				161
Kansas-----	25	35	176	23	16	7				282
Delaware-----	11	8	62	6	3					90
Maryland-----	19	70	278	23	19	1				410
Virginia-----	14	61	257	19	8					359
West Virginia-----	12	13	100	17	2					144
North Carolina-----	10	56	179	31	11					287
South Carolina-----	3	54	91	28	5					181
Georgia-----	14	22	99	23	8					166
Florida-----	7	55	71	47	5					185
Kentucky-----	2	11	97	27	6					143
Tennessee-----		35	84	66	4	1				190
Alabama-----	6	20	73	48	2					149
Mississippi-----		18	21	39	3					81
Arkansas-----	3	9	26	8	2	4				52
Louisiana-----	2	22	19	7	2					52
Oklahoma-----	8	16	67	19	9	3				122
Texas-----	5	9	101	58	18			1		192
Montana-----	2	2	10	1	9	1				25
Idaho-----	1	11	49	17	6	2				86
Wyoming-----		2	13							15
Colorado-----	2	19	53	10	16					100
New Mexico-----		11	12	14						37
Arizona-----		13	36	8	1					58
Utah-----	1	7	74	14						96
Nevada-----		3	3	8						14
Washington-----	9	41	72	18	8	2				150
Oregon-----	5	26	40	38	17					126
California-----		22	25	12	1					60
Puerto Rico-----			8							8
Hawaii-----										
Alaska-----										
Total-----	266	989	3,737	762	228	68	4	5		12,169 ^{1/} 6,059 ^{2/}

^{1/} Represents the number of individual sire records sent to States.

^{2/} Represents the number of sires summarized.

Table 4--Volume of DHIA Master File Effective January 1963.

Breed	Sires	Cows	Lactations
	(Number)	(Number)	(Number)
Ayrshire	16,775	114,044	284,538
Guernsey	61,086	465,755	1,088,534
Holstein	155,527	1,467,147	3,468,838
Jersey	45,185	325,646	788,201
Brown Swiss	13,740	80,282	200,861
Milking Shorthorn	<u>1/</u> 8,125	31,242	65,932
Red Dane			
Red Poll			
No Sire Identification	_____	<u>930,207</u>	<u>1,291,445</u>
Total	300,438	3,414,323	7,188,349

1/ Estimated.

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